HENRY B. BIGELOW
NOAA
R 225
IMO 9349057

GENERAL NOTES:

1. THE VESSEL SHALL BE CLASSIFIED UNDER ABS MALTESE CROSS A1, CIRCLE E, UNRESTRICTED SERVICE AND ICE CLASS C0.
2. ALL MATERIAL SHALL BE ORDINARY STRENGTH STEEL, GRADE A, UNLESS OTHERWISE NOTED.
3. DEEP TANK OVERFLOW HEIGHTS ARE ASSUMED AT THREE FEET ABOVE THE WEATHER DECK ABOVE THE TANK.
4. WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE NOAA "STATEMENT OF REQUIREMENTS" AND ACCEPTABLE COMMERCIAL MARINE QUALITY.
5. ALL WELDING SHALL BE IN ACCORDANCE WITH REFERENCE NO. 2.
6. END CONNECTION DETAILS SHALL BE IN ACCORDANCE WITH HMI STANDARDS, REFERENCE NO. 8.
7. STIFFENER & GIRDER END CONNECTIONS SHALL BE DESIGNATED AS FOLLOWS:
   "EC-S": CUT MEMBER ONE INCH SHORT
   "EC-W": WEB IS CONNECTED
   "EC-F": FULL CONNECTION – WEB AND FLANGE STRENGTH MAINTAINED.
   "EC-A": EFFECTIVE BRACKET PER ABS RULES, PART 3 SECTION 2.5.3
8. UNLESS OTHERWISE NOTED, ALL END CONNECTIONS SHALL BE "EC-F".
9. COPES, SNIPES AND DRAINS SHALL BE IN ACCORDANCE WITH HMI STANDARDS.
10. PLATES AND SHAPES ARE IN IMPERIAL UNITS. DIMENSIONS ARE IN METRIC UNITS.
11. FRAME SPACING = 600
12. GIRDERS SHALL BE FITTED WITH TRIPPING BRACKETS AT 3000 OR MAX. OF 5 FRAME SPACING.
13. OIL AND WATER STOPS MUST BE PROVIDED AT THE ENDS OF TANK BOUNDARY PLATING AND IN CONTINUOUS FRAMING EXTENDING THROUGH TANK BOUNDARIES. FOR ADJACENT TANKS, STOPS MUST BE PROVIDED ON BOTH SIDES OF THEIR COMMON BOUNDARIES.
14. CORNER RADIUS OF OPENINGS IN DECKS AND SHELL MUST BE GENERALLY 1/8 x TRANSVERSE DIMENSION OF OPENING, WITH A MINIMUM OF 150 AND A MAXIMUM OF 600. ON MAIN TRANSVERSE BULKHEADS, CORNER RADIUS MUST BE 1/20 x VERTICAL DIMENSION WITH A MINIMUM OF 150.
15. CENTERBOARD TRUNK SCANTLINGS & END CONNECTION TYPES TO MAIN HULL STRUCTURE PROVIDED IN REF # 14

FUME–TIGHT (FT) BULKHEAD DETAILS

LOCATION	ORIENTATION	STIFFENER SPACING (mm)	PLATE THICKNEES (in)	STIFFENER TYPE	END CONN. TOP	END CONN. BOTTOM
TANK TOP	TRANSVERSE	625	5/16	L4x3x1/4	S	S
TANK TOP	LONG'L	600	5/16	L4x3x1/4	S	S
2ND DECK	TRANSVERSE	625	5/16	L3x2x1/4	S	S
2ND DECK	LONG'L	600	5/16	L3x2x1/4	S	S
MAIN DECK	TRANSVERSE	625	1/4	L3x2x1/4	S	S
MAIN DECK	LONG'L	600	1/4	L3x2x1/4	S	S
STAIRWELLS	TRANSVERSE	625	1/4	L3x2x1/4	S	S
STAIRWELLS	LONG'L	600	1/4	L3x2x1/4	S	S

THIS TABLE IS APPLICABLE THROUGHOUT THE VESSEL U.N.O.

REVISIONS

REV	ZONE	DESCRIPTION	DATE	APPROVED
1		1. SH 2, PLAN 14–C: MOVED STBD DECK OPENING FROM 6047 TO 6883 TO SUIT THE RELOCATION OF A VENT TRUNK BELOW DECKS. 2. SH. 4, SECTION 25–C: DELETED BRACKETS, EC–W CONNECTION OBTAINED BY OTHER MEANS PER PRODUCTION DESIGN MODULE DRAWINGS. ITEM 1 PER OWNER COMMENT ITEM 2 PER ENGINEERING DEVELOPMENT	4/21/04 AGE	4/22/04 RG
2		1. EXTENDED HULL APPLICABILITY TO INCLUDE HULL 1956. ITEM 1 PER ENGINEERING DEVELOPMENT.	3/21/05 RMW	3/21/05 FH
3		1. SH 2, PLAN 9–C: ADDED PLAN VIEW OF SEA CHEST TOP PLATE. ITEM 1 PER ECP 0065.	6/9/05 AGE	6/15/05 FH
4		1. SH 1, DRAWING INDEX: ADDED SHEET 7 TO INDEX. 2. SH 4, PLAN 27–C: DELETED HEADERS IWO FORMER SIDE A–FRAME BASE LOCATION; ADDED 1/2" INSERT PLATE; CHANGED DECK STIFFENERS FROM L5x3x5/16 TO 14x5x3/8 FLANGE PLATE GIRDERS AT FRAMES 41 AND 42. 3. SH 5, ELEVATION 35–A: ADDED 4x1/2" COLLAR AROUND MAIN DECK PORTLIGHT OPENING AT FRAME 41; DELETED HEADER ABOVE PORTLIGHT; ADDED HEADERS AT MID–QUARTER POINT OF COLLAR RING 4. SH 5, ELEVATION 35–A: ADDED WT/FT BULKHEADS FOR VENTILATION TRUNK. 5. SH 7: ADDED SHEET TO PROVIDE STARBOARD SIDE SHEEL AND 01 LEVEL DECK DETAILS FOR FRAMES 41 AND 42. ITEMS 1 AND 4 PER ENGINEERING DEVELOPMENT ITEMS 2, 3 AND 5 PER ECP 0090	7/21/05 AGE	7/26/05 FH
5		1. SH 2, HULL PENETRATIONS FOR SONAR SYSTEMS ADDED. ITEMS 1 PER ECP 0093	4/19/06 MDP	4/27/06 SM
6		1. SH 4, PLAN 27–C: ADDED PLATE INSERT FOR HULL 1956 AND CLARIFIED PLATE INSERT FOR HULL 1953 AND INCLUDED HULL 1957 APPLICABILITY. 2. SH 6. ELEVATION 42–A: REVISED DOOR CUTOUT LOCATION. 3. EXTENDED HULL APPLICABILITY TO INCLUDE HULL 1957. ITEM 1 PER ENGINEERING DEVELOPMENT ITEM 2 PER AS–BUILT CONDITION	5/3/06 MDP	5/10/06 SM

REVISIONS CONT'D

REV	ZONE	DESCRIPTION	DATE	APPROVED
10		1. SH 1, THIS REVISION REFLECTS AS–BUILT CONDITIONS FOR HULL 1956. 2. SH 5, ELEVATION 35–A; ADDED WINDOW AT FRAME 49, MAIN DECK PORT SIDE. 3. SH 6, SECTION 46–A; ADDED WINDOW AT FRAME 49, MAIN DECK PORT SIDE. ITEM 1 PER ENGINEERING DEVELOPMENT ITEMS 2 & PER ECP 056C THIS REVISION APPLICABLE TO M283/M284 ONLY	10/30/08 MDP	11/11/08 FH
11		1. SH 5, ELEVATION 35–A; CHANGED WINDOW AT FRAME 49 TO PORTLIGHT. 2. SH 6, SECTION 46–A; CHANGED WINDOW AT FRAME 49 TO PORTLIGHT. ITEM 1 THRU 2 PER ENGINEERING DEVELOPMENT THIS REVISION APPLICABLE TO M284 ONLY	6/24/09 MDP	

REVISIONS CONT'D

REV	ZONE	DESCRIPTION	DATE	APPROVED
7		1. SH 1, THIS REVISION REFLECTS AS–BUILT CONDITIONS FOR HULL 1953. ITEM 1 PER ENGINEERING DEVELOPMENT	9/26/06 MDP	9/28/06 SM
8		1. SH 6, ELEVATION 42–A; RELOCATED DOOR CLEAR OPENING BETWEEN FR 46 & FR 47 300MM FWD OF FR 46 TO MATCH THE STRUCTURAL DOOR SCHEDULE, FH62, AND MODIFIED SCANTLING AROUND OPENING TO SUIT. 2. SH 6, SECTION 41–A; RELOCATED DOOR CLEAR OPENING TO 6614MM OCL TO MATCH DOOR SCHEDULE. CHANGED DOOR CLEAR OPENING TO 36"X72" W/ SILL HGT OF 152MM TO MATCH DOOR SCHEDULE AND MODIFIED SCANTLING AROUND OPENING TO SUIT. EXTENDED DOOR HEADER TO 5548MM OCL AND ADDED VERTICAL STIFFENER BELOW HEADER AT 6016MM OCL AND ADDED VERTICAL STIFFENER ABOVE HEADER AT 6173MM OCL. ITEM 1 & 2 PER ADDITIONAL INFORMATION FOUND TO SUIT AS–BUILT CONDITIONS	10/23/06 MDP	11/2/06 SM
9		1. SH 2, PLAN 11–C; ADDED 3"X1/4" FLAT BAR CLIPS BETWEEN FR 46 & 47, 2. SH 2, PLAN 14–A; ADDED 3"X1/4" FLAT BAR CLIPS BETWEEN FR 46 & STAIRWELL BHD, 3. SH 6, SECTION 46–C; ADDED 3"X1/4" FLAT BAR CLIPS BETWEEN FR 46 & STAIRWELL BHD, ITEM 1 THRU 3 PER YARD REQUEST THIS REVISION APPLICABLE TO HULLS 1956/1957 ONLY	7/9/07 MDP	7/16/07 FH

CONT'D IN ZONE 5–B

DOCUMENT DISTRIBUTION RECORD

DATE IN ROOM	9/5/03	4/22/03	3/22/05	6/14/05	7/22/05	4/19/06	5/3/06	9/26/06	10/23/06	7/16/07	11/10/08		
ISSUE DATE	9/8/03	4/23/04	3/24/05	6/16/05	7/26/05	4/27/06	5/10/06	9/28/06	11/7/06	7/17/08	11/11/08		
REV#	0	1	2	3	4	5	6	7	8	9	10	11	
PROJECT ENG	1	1	1	1	1	1							
PROJECT MGR	1	1	1	1	1	1							
ABS	10											E/E	
USPH													
USCG													
HMP PC	12	12	12	12	12	12	1	1	1	1	1	1	
PROD DESIGN GROUP	1(3)	(3)	(3)						1	1	1	1	
HULL MGR													
HULL LEAD	(1)	(1)	(1)	(1)	(1)	(1)	1	1	1	1	1	1	
HVAC	1	1	1										
JOINER	1	1	1										
HPG PC	3	3	3	3	3	3	1	1	1	1	1	1	
NOISE CONT													
CHAND, LLC	1									1	1	1	
ISSUED BY	AE	AE	AE	AE	AE	SM	SM	SM	SM	FH	FH		

DWG NO. M282–110–FH03 SH 1

RESERVATIONS:

REFERENCES

NO.	TITLE	DRAWING NUMBER
15	CATCH HANDLING EQUIPMENT, KEY PLAN & DETAILS	M282–085–FH86
14	TRUNK SCANTLING	M282–150–FH30
13	IMPRESSED CURRENT CATHODIC PROTECTION ARRANGEMENT & DETAILS	M282–624–FE70
12	WINDOWS & PORTLIGHTS KEY PLAN & SCHEDULE	M282–611–FH87
11	TRANSDUCER INSTALLATION DETAILS	M282–169–FH50
10	STRUCTURAL DOOR, HATCHES & MANHOLES – KEY PLAN AND SCHEDULE	M282–167–FH62
9	DK FITTINGS & TIEDOWN KEY PLAN & DETAILS	M282–100–FH89
8	TYPICAL STRUCTURAL DETAILS	M282–100–FH67
7	BILGE KEEL LAYOUT	M282–110–FH54
6	AFT HOUSE SCANTLINGS, 01 LVL–03 LVL FR39–AFT	M282–110–FH12
5	HULL STERNBODY SCANTLING	M282–110–FH04
4	HULL FOREBODY SCANTLING	M282–110–FH02
3	FWD HOUSE SCANTLINGS, 01 LVL–03 LVL FR39–FWD	M282–110–FH11
2	WELDING BOOKLET	M282–100–FH90
1	GENERAL ARRANGEMENT	M282–101–FA02

DRAWING INDEX

SH	DESCRIPTION
7	SECTIONS
6	SECTIONS
5	CENTERLINE, OUTBOARD PROFILE & DETAILS
4	ELEVATIONS
3	SECTIONS
2	PLANS
1	TITLE SHEET

HULL APPLICABILITY

1 M282 HULL 1953
3 M283 HULL 1956
6 M284 HULL 1957

10	9	8	7	6	5	4	3	2	1	SHT
			4	11	11	6	0	9	11	REV

REVISION STATUS

DRL NUMBERS

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FUNCTIONAL DESIGN DRAWING
NOT FOR CONSTRUCTION

VT Halter Marine, Inc.
Vision Technologies Systems

DRAWN BY RW 7/29/03	ABS APPV	
CHECKED BY AE 8/30/03	USCG APPV	
APPROVED BY JCO 9/5/03	OWNER APPV	
HULL NO APPLICABILITY	CAGE CODE 38213	SIZE D
ESTIMATE NO 00–104	SCALE	

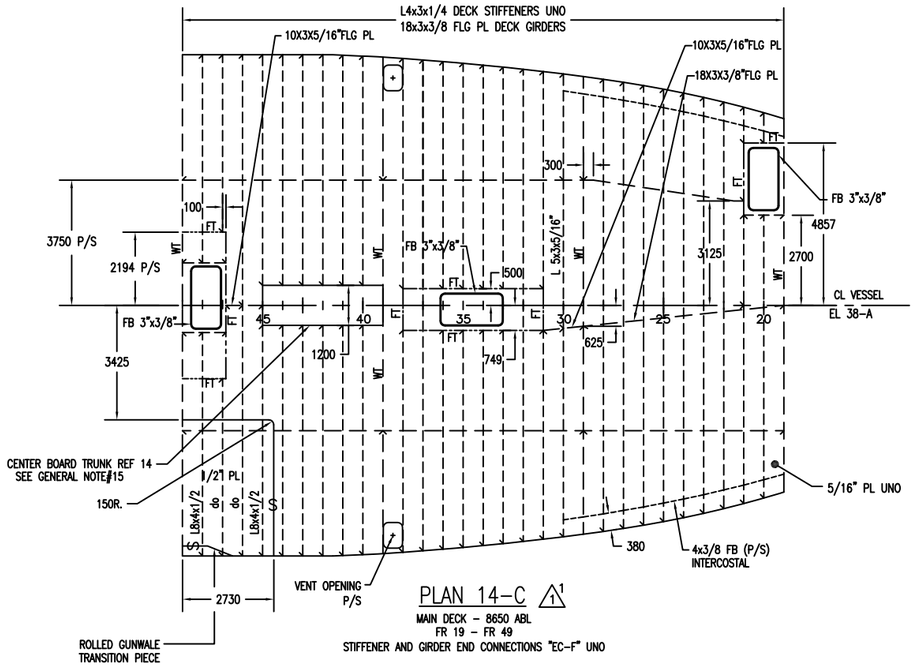
VESSEL: FRV40 CLASS 63m FISHERIES RESEARCH VESSEL

TITLE: HULL MIDBODY SCANTLINGS FR. 19 – FR. 49

JOB NO.	ITEM	DELIVERABLE	SHEET	REV
M282	110	FH03	001	11

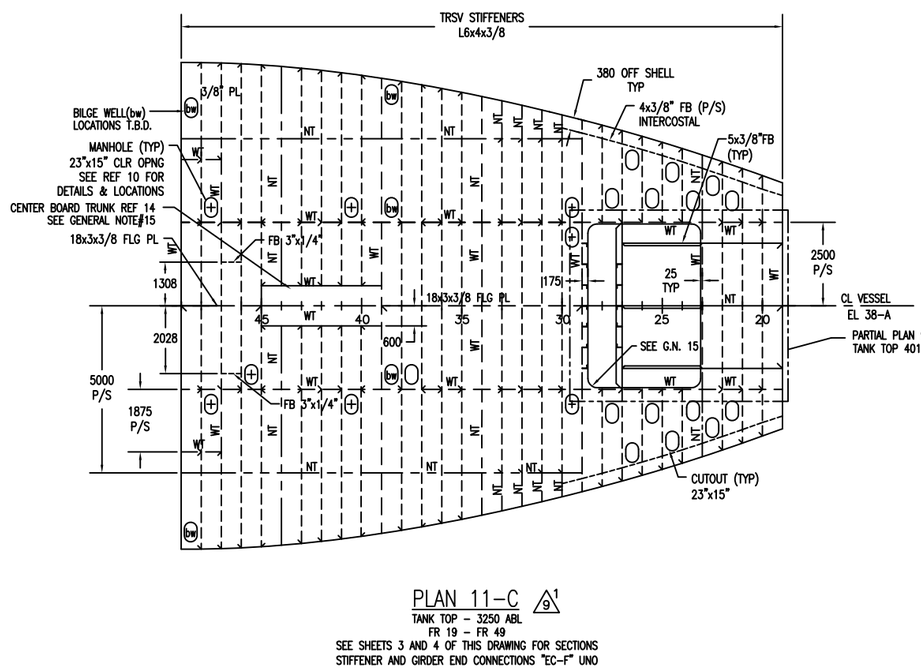
FILE R:\M282\FUNCTIONALDESIGN\INWORK\HULLDWGS SHEET 1 OF 7

PLOT: 1=1



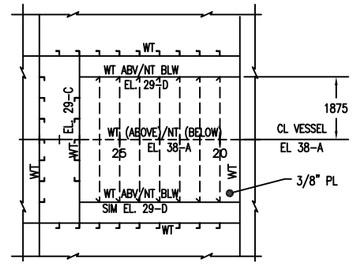
PLAN 14-C $\frac{1}{1}$

MAIN DECK – 8650 ABL
FR 19 – FR 49
STIFFENER AND GIRDER END CONNECTIONS "EC-F" UNO



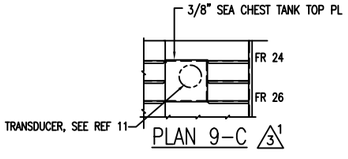
PLAN 11-C $\frac{9}{1}$

TANK TOP – 3250 ABL
FR 19 – FR 49
SEE SHEETS 3 AND 4 OF THIS DRAWING FOR SECTIONS
STIFFENER AND GIRDER END CONNECTIONS "EC-F" UNO

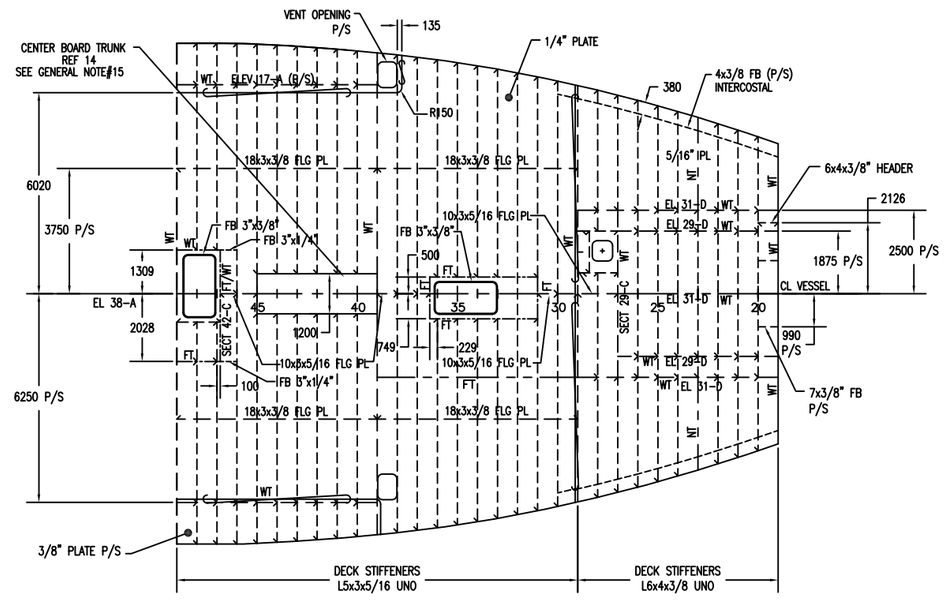


PLAN 9-D

TANK BOTTOM – 4015 ABL
FR 19 – FR 29
L5x3x5/16 TRSV STIFFENERS

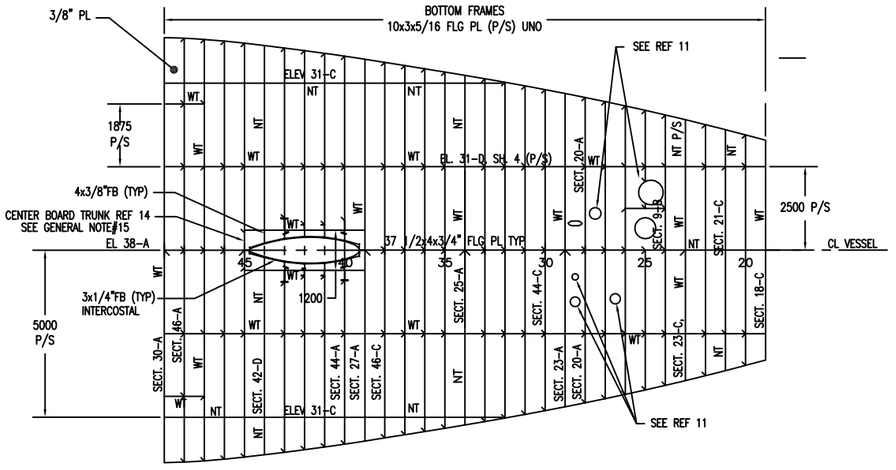


PLAN 9-C $\frac{3}{1}$



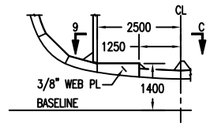
PLAN 14-A $\frac{9}{2}$

2ND DECK – 6000 ABL
FR 19 – FR 49
STIFFENER AND GIRDER END CONNECTIONS "EC-F" UNO



PLAN 11-A $\frac{5}{1}$

BOTTOM SHELL
FR 19 – FR 49
STIFFENER AND GIRDER END CONNECTIONS "EC-F" UNO



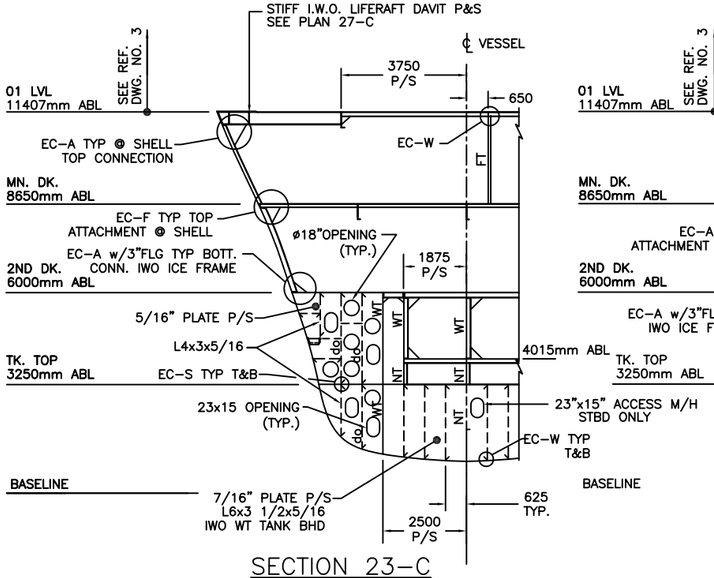
SECTION 9-B

FR. 24 LOOKING FWD
FR 26 SIMILAR

HULL NO	CAGE CODE	SIZE	JOB NO.	ITEM	DELIVERABLE	SHEET	REV
APPLICABILITY	3B213	D	M282	110	FH03	002	09
ESTIMATE NO 00-104	SCALE 1:80		FILE R:\M282\FUNCTIONALDESIGN\INWORK\HULLDWGS			SHEET 2 OF 7	

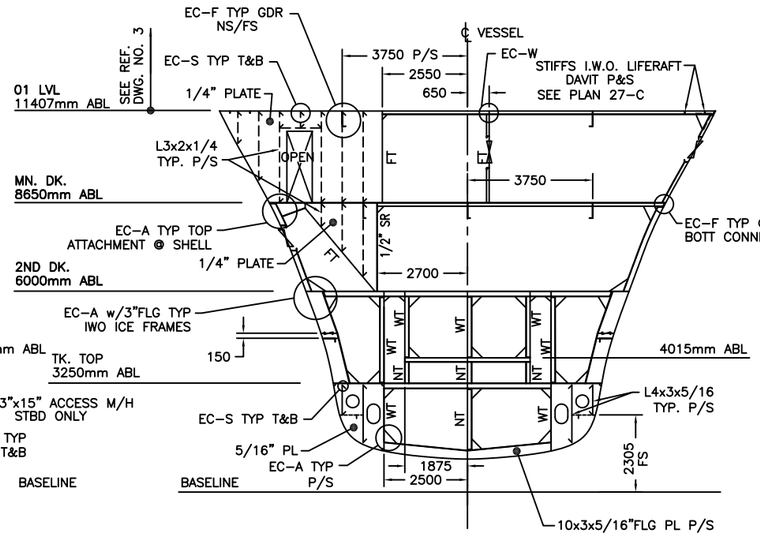
PLOT: 1=1

DWG NO. M282-110-FH03 SH 2



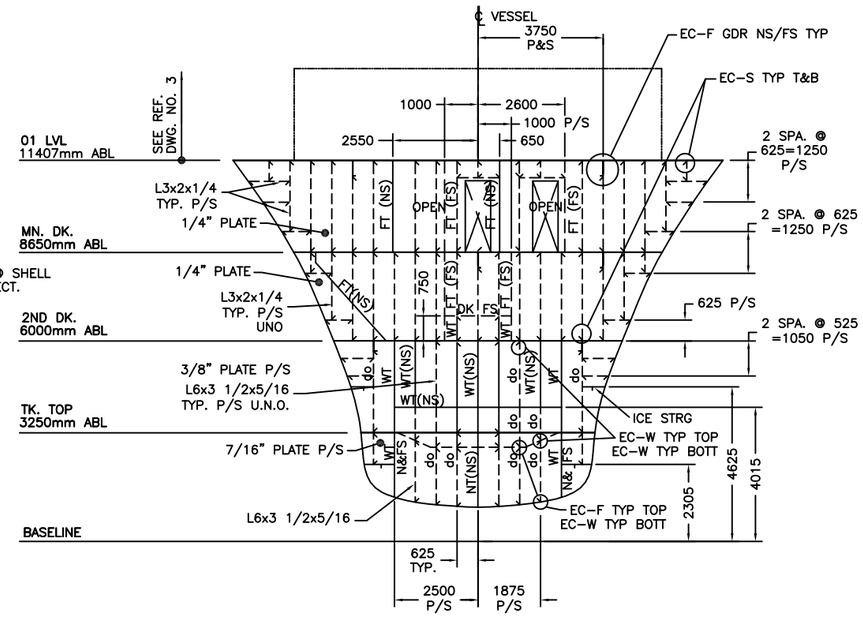
SECTION 23-C

WT BHD @ FR. 23
LOOKING FORWARD
(ZONE: 10-A, SH.2)
STIFFENER & GIRDER
END CONN. "EC-F" UNO



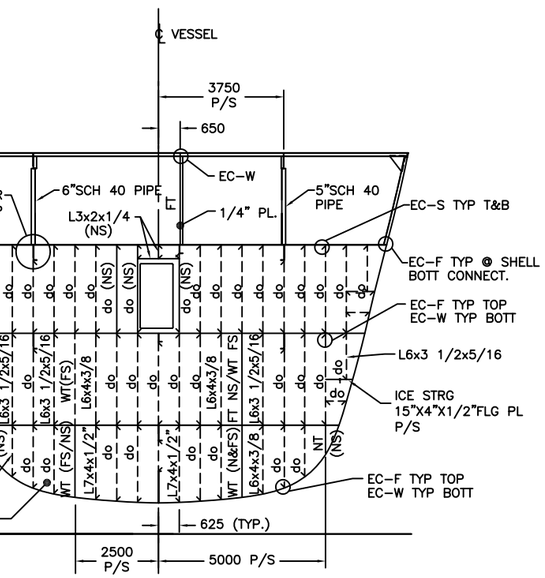
SECTION 21-C

FR. 21
LOOKING FORWARD
(ZONE: 10-A, SH.2)
STIFFENER & GIRDER
END CONN. "EC-F" UNO



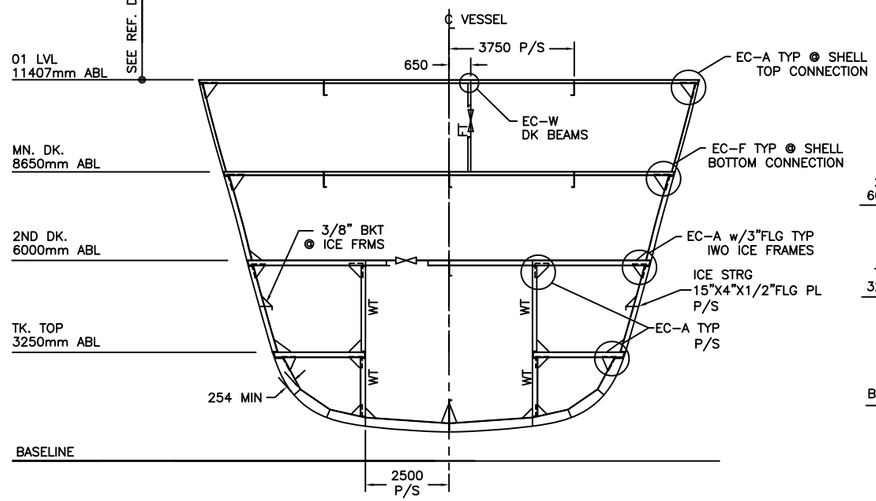
SECTION 18-C

WT BHD @ FR. 19
LOOKING FORWARD
(ZONE: 10-A, SH.2)
STIFFENER & GIRDER
END CONN. "EC-F" UNO



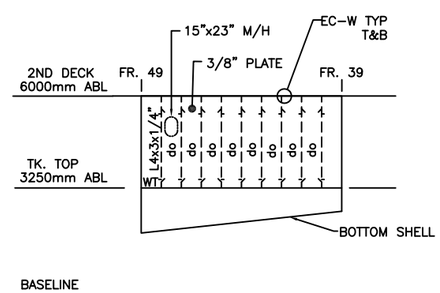
SECTION 23-A

WT BHD @ FR. 29
LOOKING FORWARD
(ZONE: 11-A, SH.2)
STIFFENER & GIRDER
END CONN. "EC-F" UNO



SECTION 20-A

FR. 28
LOOKING FORWARD
(ZONE: 11-A, SH.2)
STIFFENER & GIRDER
END CONN. "EC-F" UNO

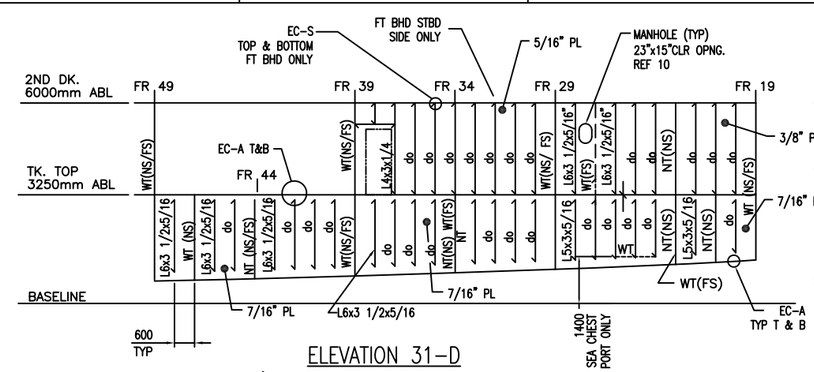


ELEVATION 17-A

WT LONG'L BHD 6250 OFF CL SHIP P/S
PORT, LOOKING OUTBD. STBD, SIM. OPP. HD.
(ZONE: 15-A/B, SH.2)

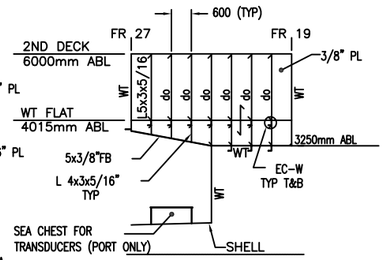
HULL NO	CAGE CODE	SIZE	JOB NO.	ITEM	DELIVERABLE	SHEET	REV
1953	3B213	D	M282	110	FH03	003	00
ESTIMATE NO	SCALE		FILE R:/M282/FUNCTIONAL/ISSUED/HULLDWG/FH03-003_00.DWG		SHEET 3 OF 7		
00-104	1:80						PLOT: 1=1

DWG NO. M282-110-FH03 SH 3



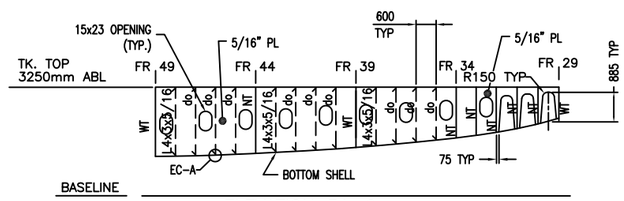
ELEVATION 31-D

WT LONG'L BHD 2500mm OFF CL SHIP, FR. 19 TO FR. 49
STBD SHOWN, PORT SIM OPP. HD. (U.N.O.)
LOOKING INBD
(ZONE: 10-B, SH.2)



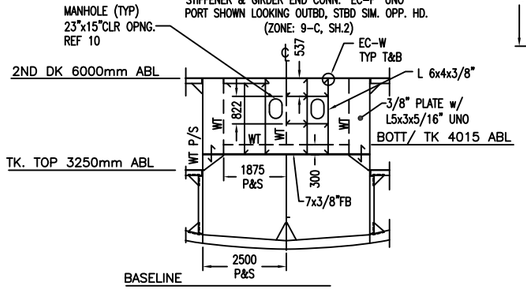
ELEVATION 29-D

WT/NT LONG'L BHD 1875mm OFF CL SHIP P/S
FR. 19 TO FR. 27
STIFFENER & GIRDER END CONN. "EC-F" UNO
PORT SHOWN LOOKING OUTBD, STBD SIM. OPP. HD.
(ZONE: 9-C, SH.2)



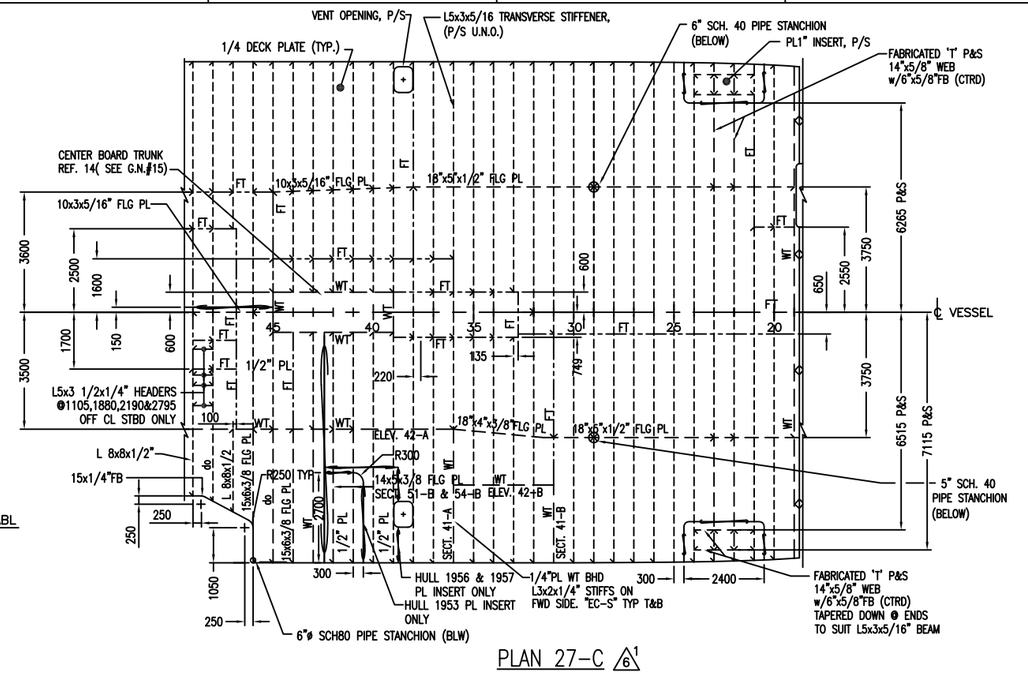
ELEVATION 31-C

NT LONG'L BHD 5000mm OFF CL SHIP P/S
FR. 29 TO FR. 49 LOOKING OUTBOARD
PORT SHOWN, STBD SIM. OPP. HD.
(ZONE: 11-B, SH.2)
STIFFENER & GIRDER END CONN. "EC-F" UNO



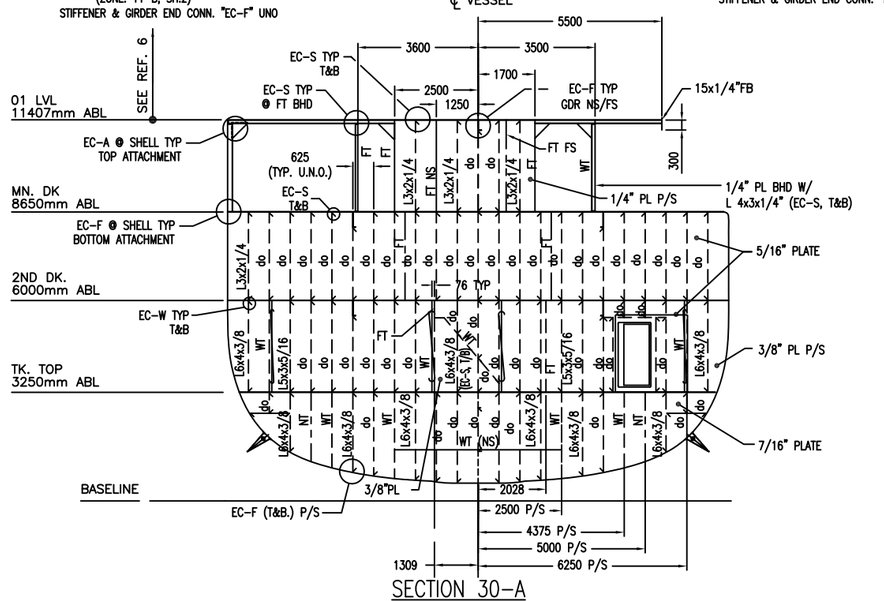
SECTION 29-C

FRAME 27, LOOKING FORWARD
(ZONE: 9-C, SH.2)
STIFFENER & GIRDER END CONN. "EC-F" UNO



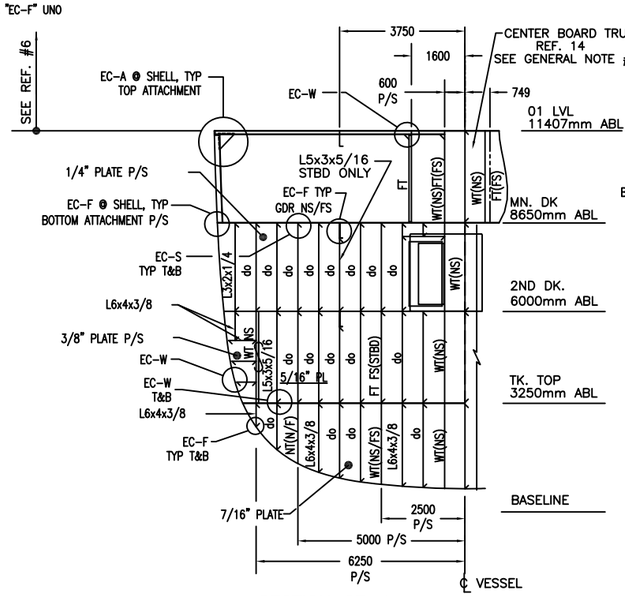
PLAN 27-C (6/1)

01 LEVEL- 11407mm ABL
FR. 19 - FR. 49
FRAME SPACING = 600mm U.N.O.
STIFFENER & GIRDER END CONN. "EC-F" UNO



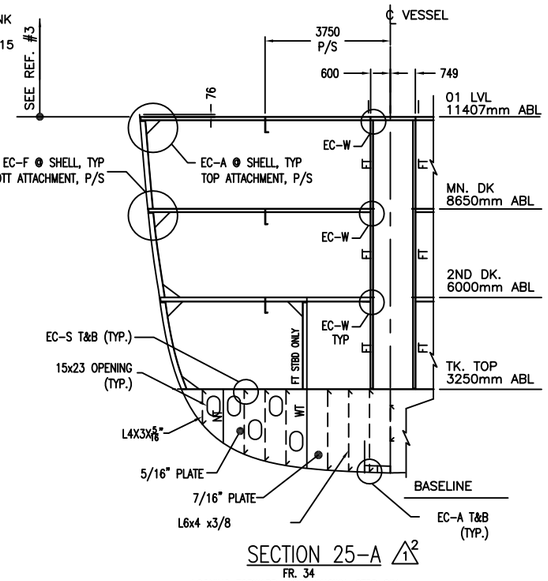
SECTION 30-A

FR. 49
LOOKING FORWARD
(ZONE: 12-B, SH.2)
STIFFENER SPACING 625mm
STIFFENER & GIRDER END CONN. "EC-F" UNO



SECTION 27-A

FR. 39
LOOKING FORWARD
(ZONE: 11-B, SH.2)
STIFFENER & GIRDER END CONN. "EC-F" UNO

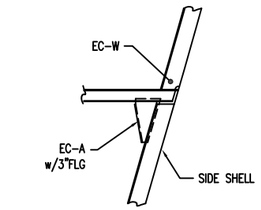


SECTION 25-A (2/1)

FR. 34
LOOKING FORWARD, PORT SHOWN, STBD SIM.
(ZONE: 11-B, SH.2)
STIFFENER & GIRDER END CONN. "EC-F" UNO

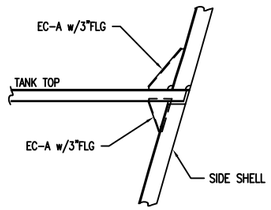
DWG NO. M282-110-FH03 SH 4

HULL NO	CAGE CODE	SIZE	JOB NO.	ITEM	DELIVERABLE	SHEET	REV
1953	3B213	D	M282	110	FH03	004	06
ESTIMATE NO	SCALE		FILE R:\M282\FUNCTIONALDESIGN\INWORK\HULLDWGS			SHEET 4 OF 7	
00-104	1:80						PLOT: 1=1



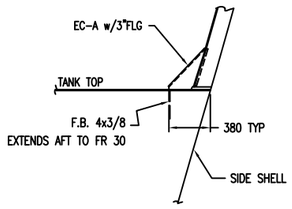
DETAIL 40-D

SCALE: 1:25
UPPER END OF MAIN ICE FRAMES
AND 18x4x1/2 FLG PL ICE WEBS



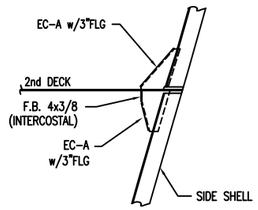
DETAIL 38-D

SCALE: 1:25
LOWER END OF MAIN ICE FRAMES



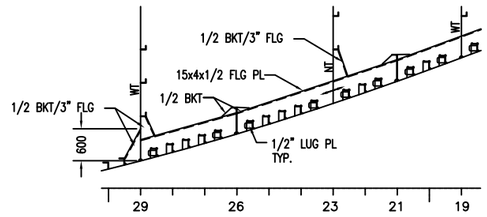
DETAIL 37-D

SCALE: 1:25
LOWER END OF INTERMEDIATE
ICE FRAMES



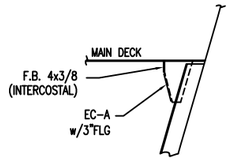
DETAIL 36-D

SCALE: 1:25
END CONN. DETAILS
@ INTERMEDIATE DECKS



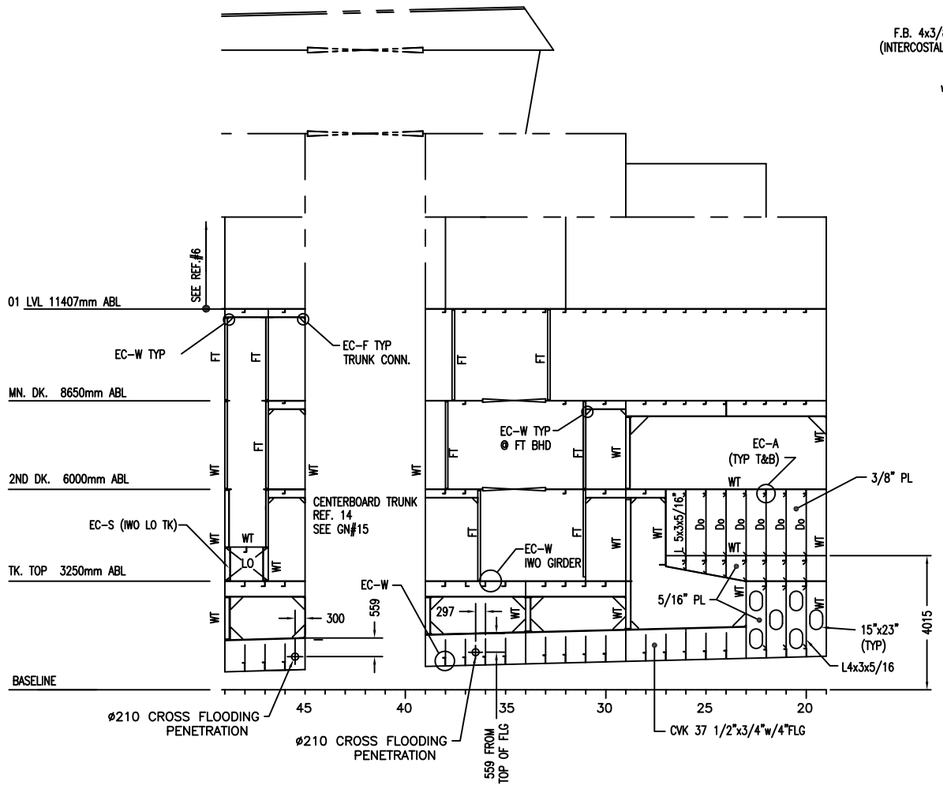
PLAN 34-C

SCALE: 1:50
ICE STRINGER 4625mm ABL



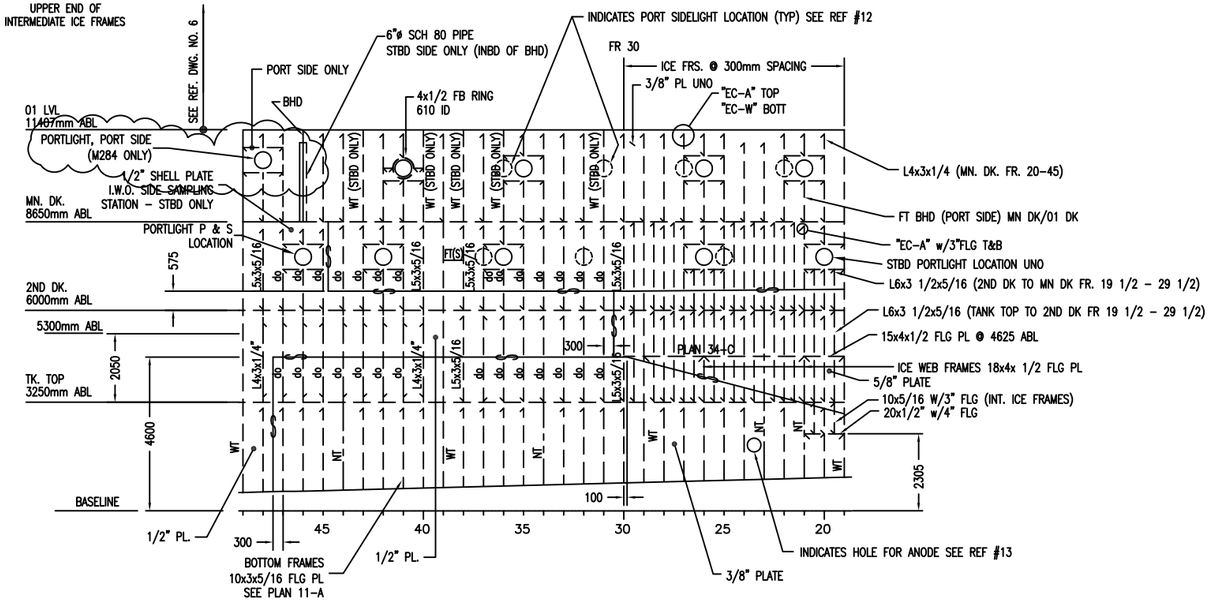
DETAIL 37-C

SCALE: 1:25
UPPER END OF
INTERMEDIATE ICE FRAMES



ELEVATION 38-A

SCALE: 1:80
CENTERLINE PROFILE
STBD LKG INBD.
STIFFENER & GIRDER END CONN. "EC-F" UNO



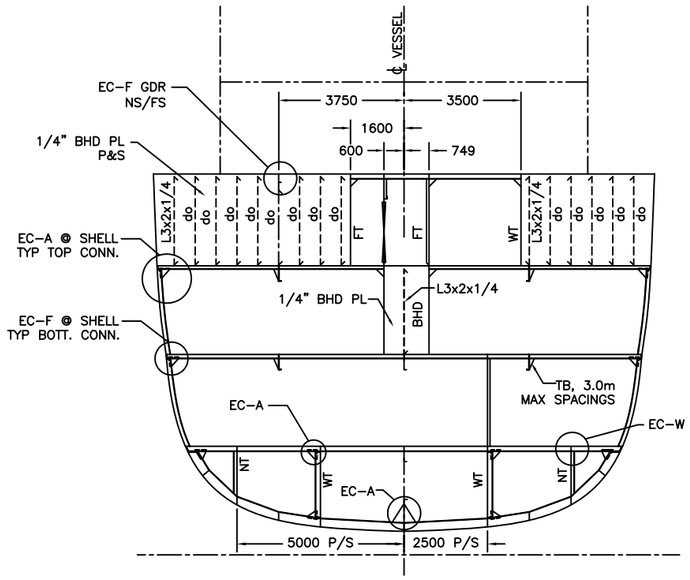
ELEVATION 35-A $\triangle^{3,4}_{4}$ $\triangle^{1}_{10}$ $\triangle^{1}_{11}$

SCALE: 1:80
SHELL PROFILE
FRS. @ 600mm SPACING
STBD SHOWN, PORT SIM. OPP. HD.
FOR CONNECTION DETAILS IWO ICE FRAMES
SEE DETAIL 34-C, 36-D, 37-C, 37-D, 38-D & 40-D THIS DWG.

DWG NO. M282-110-FH03 SH 5

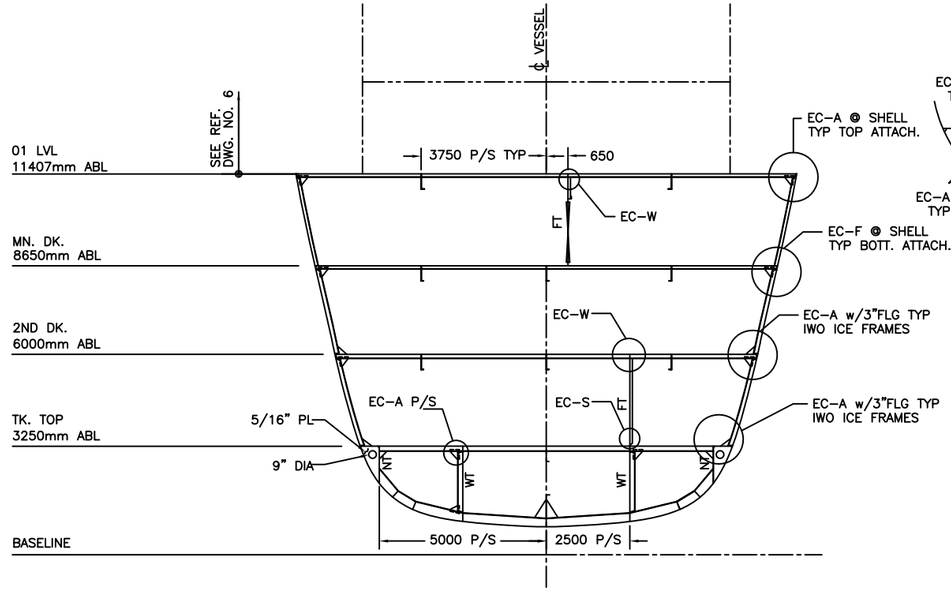
HULL NO	CAGE CODE	SIZE	JOB NO.	ITEM	DELIVERABLE	SHEET	REV
1953	3B213	D	M282	110	FH03	005	11
ESTIMATE NO 00-104	SCALE AS NOTED		FILE R:\M282\FUNCTIONALDESIGN\INWORK\HULLDWGS			SHEET 5 OF 7	

PLOT: 1=1



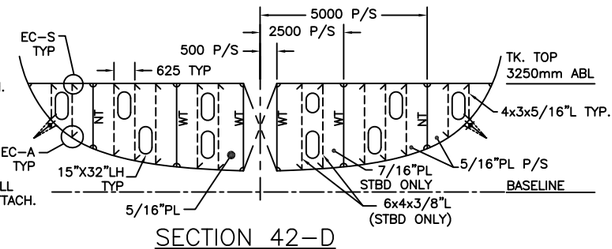
SECTION 46–C

FR. 38
LOOKING FORWARD
(ZONE: 12–B, SH.2)
STIFFENER & GIRDER END CONN. "EC–F" UNO



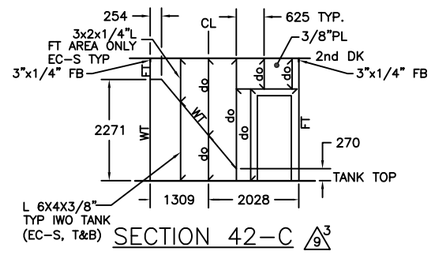
SECTION 44–C

FR. 30
PORT, LOOKING FORWARD
(ZONE: 12–B, SH.2)
STIFFENER & GIRDER END CONN. "EC–F" UNO



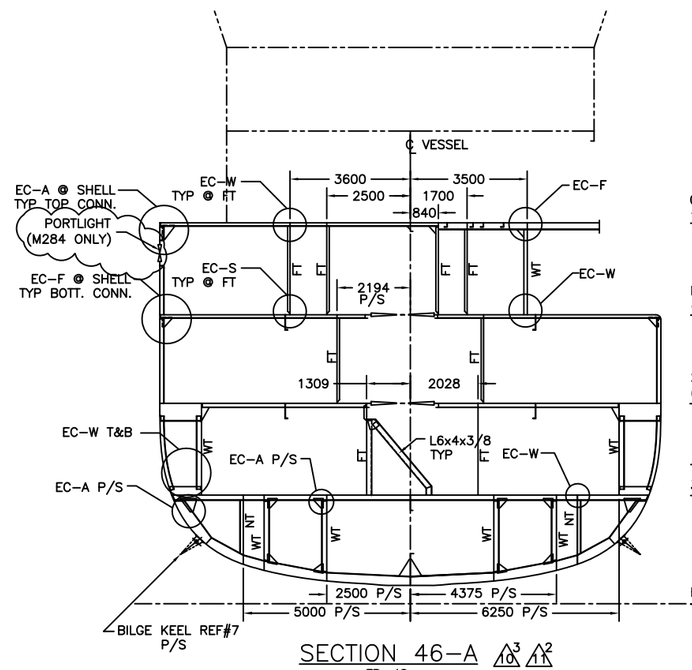
SECTION 42–D

FR. 44
LOOKING FORWARD
(ZONE: 11–A, SH.2)



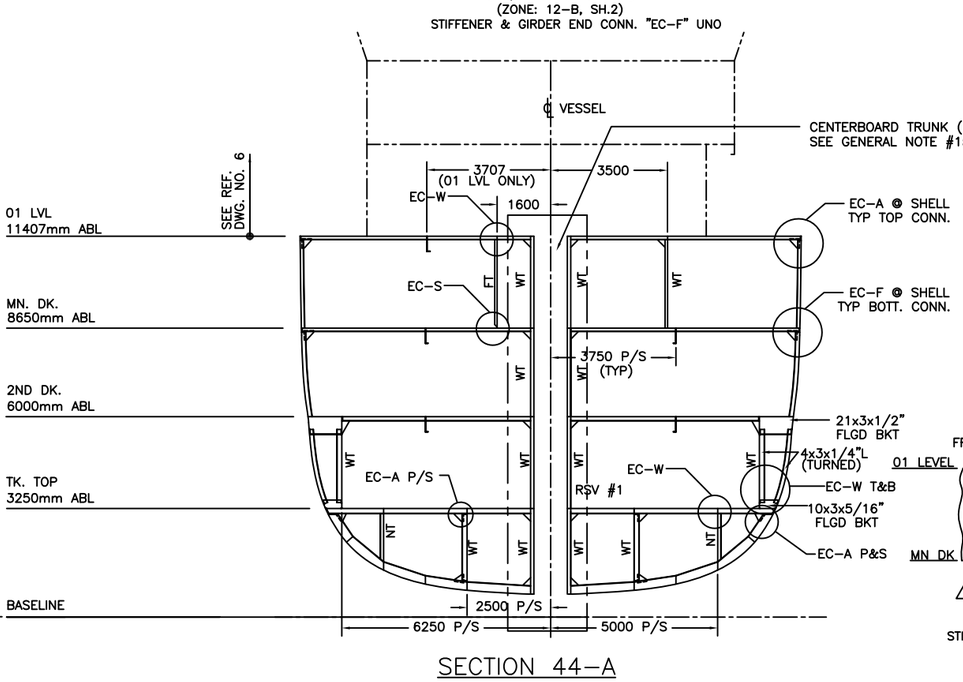
SECTION 42–C 9/3

FT/WT BHD 100mm FWD FR.47
LOOKING FORWARD
(ZONE: 14–A, SH.2)
SCALE 1/60
STIFFENER & GIRDER END CONN. "EC–F" UNO



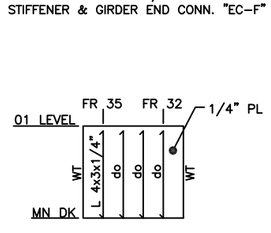
SECTION 46–A 10/3 11/2

FR. 48
LOOKING FORWARD
(ZONE: 12–B, SH.2)
STIFFENER & GIRDER END CONN. "EC–F" UNO



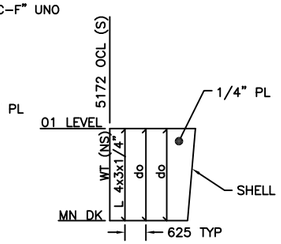
SECTION 44–A

FR. 40
LOOKING FORWARD
(ZONE: 12–B, SH.2)
STIFFENER & GIRDER END CONN. "EC–F" UNO



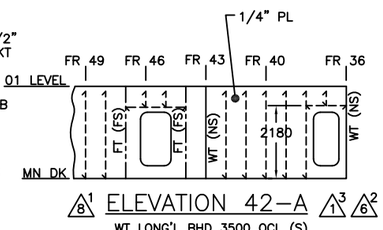
ELEVATION 42–B

WT LONG'L BHD 5172 OCL (S)
LKG INBD
STIFFENER & GIRDER
END CONN. "EC–S" U.N.O.



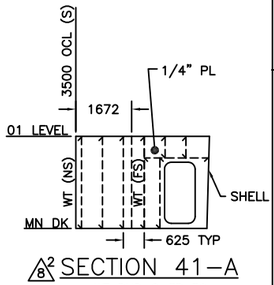
SECTION 41–B

WT BHD @ FR 31 (S)
LKG FWD
STIFFENER & GIRDER
END CONN. "EC–S" U.N.O.



8/1 ELEVATION 42–A 1/3 6/2

WT LONG'L BHD 3500 OCL (S)
LKG INBD
STIFFENER & GIRDER END CONN. "EC–S" U.N.O.
BHD STIFF L4x3x1/4 UNO



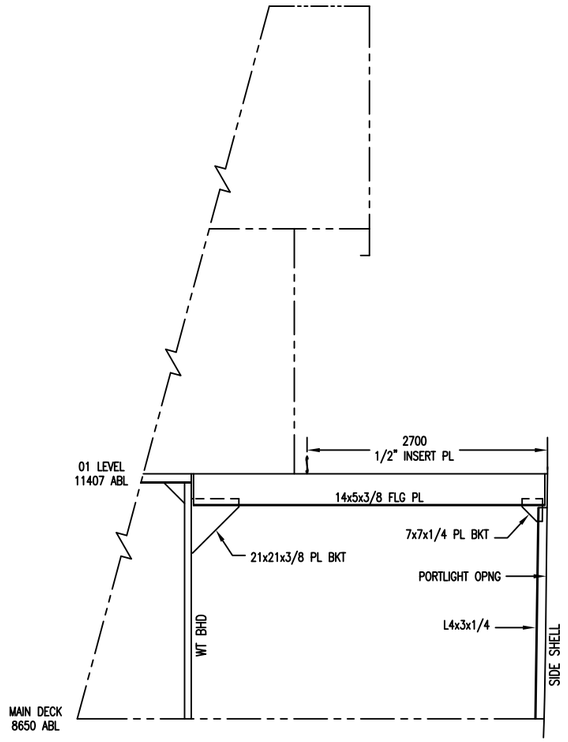
8/2 SECTION 41–A

WT BHD @ FR 36
LKG FWD
STIFFENER & GIRDER
END CONN. "EC–S" U.N.O.
BHD STIFF L4x3x1/4 UNO

HULL NO	CAGE CODE	SIZE	JOB NO.	ITEM	DELIVERABLE	SHEET	REV
1953	3B213	D	M282	110	FH03	006	11
ESTIMATE NO 00–104	SCALE 1:80		FILE R:/M282/FUNCTIONAL/ISSUED/HULDWG/FH03–006–10.DWG			SHEET 6 OF 7	

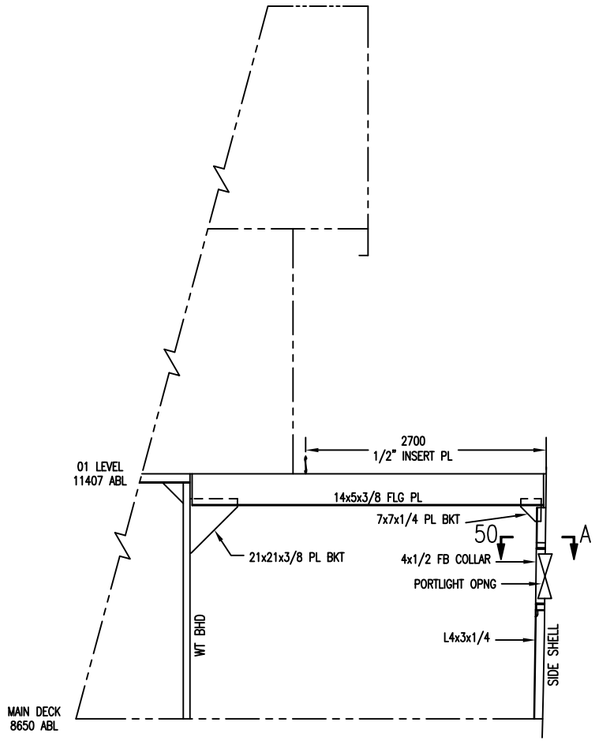
DWG NO. M282–110–FH03 SH 6

PLOT: 1=1



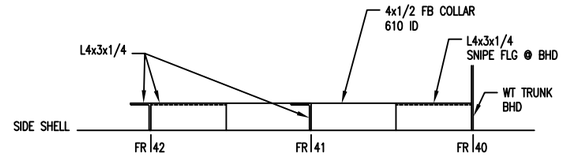
SECTION 54–B

FRAME 42
LOOKING FWD



SECTION 51–B

FRAME 41
LOOKING FWD



SECTION 50–A

HULL NO	CAGE CODE	SIZE	JOB NO.	ITEM	DELIVERABLE	SHEET	REV
1953	3B213	D	M282	110	FH03	007	04
ESTIMATE NO 00–104	SCALE 1:30		FILE R:\M282\FUNCTIONAL DESIGN\INWORK\HULLDWGS			SHEET 7 OF 7	

PLOT: 1=30

DWG NO. M282–110–FH03 SH 7